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Examining the Influence of Teacher Behavior and Classroom Context on the Behavioral and Academic Outcomes for Students With Emotional or Behavioral Disorders

Kevin S. Sutherland
Virginia Commonwealth University
Teri Lewis-Palmer
Oregon State University
Janine Stichter
University of Missouri–Columbia
Paul L. Morgan
Pennsylvania State University

Many students with emotional or behavioral disorders (EBD) display both learning and behavioral problems that make it difficult for teachers to provide effective instruction. In turn, a lack of exposure to effective instruction contributes to poor academic and behavioral outcomes. In this article, the authors argue that the interaction between the learning and behavior problems of students with EBD is complex and likely characterized by multiple influences, including classroom contextual factors. The authors detail (a) ways that teacher instructional behaviors and classroom contexts may contribute to the relationship between learning and behavior problems of students with EBD and (b) assessment procedures helpful for measuring classroom contextual variables. Implications for future research are discussed, including using data gleaned from applied research to inform future randomized clinical trials examining classroom-based interventions for students with EBD.

Keywords: *emotional and behavioral disorders; intervention research; classrooms; behavior problems*

Students with emotional or behavioral disorders (EBD) exhibit learning problems and behavioral deficits (Kauffman, 2005). For example, Greenbaum et al. (1996) found that the percentage of children with EBD who were reading below grade level increased from 54% to 85% across their study's 7-year span. Nelson, Benner, Lane, and Smith (2004) reported that 83% of their study's sample of children with EBD scored below the norm group on a standardized measure of reading skill. Consequently, students with EBD make much less academic progress than either their nondisabled peers or those with learning disabilities (Anderson, Kutash, & Duchnowski, 2001). For example, the meta-analysis by Reid, Gonzalez, Nordness, Trout, and Epstein (2004) of 25 studies, which compared the academic achievement of students with EBD and typically developing same-age peers, found an effect size of .69 favoring typically developing students. This pattern held across all academic subject areas.

The dual deficits of learning and behavior problems may make it difficult for practitioners to provide effective instruction. On one hand, the typical EBD student's academic problems can be so substantial as to require intensive remediation. On the other hand, the student's lack of motivation, frequent disruptions, and aggressive behavior can overwhelm a teacher's attempts to provide such instruction, especially within

Authors' Note: Address: Kevin S. Sutherland, Oliver Hall, 1015 W. Main St., PO Box 842020, Richmond, VA 23284; e-mail: kssuther@vcu.edu.

a classroom context where multiple students present multiple academic and behavioral needs.

Traditionally, both researchers and practitioners have focused their intervention efforts on EBD students' disruptive behaviors and social skills deficits. However, the poor academic progress displayed by students with EBD, as well as the bleak postschool outcomes associated with the resulting school failure—for example, unemployment, mental health issues, high rates of incarceration, and poor social support (Bradley, Henderson, & Monfore, 2004; U.S. Department of Health and Human Services, 1999)—have led to an increasing focus on academic deficits (e.g., Lane, 2004).

Yet exclusive efforts to bolster EBD students' academic skills may be misplaced and may not lead to long-term gains in either their academic achievement or behavior. That is, an either–or choice may be a false dichotomy. Instead, it may be important for practitioners to focus their intervention efforts on both the academic and behavioral deficits of students with EBD because (a) a multitude of factors influence the social and emotional development and the academic development of students with EBD (Farmer, Quinn, Hussey, & Holohan, 2001) and (b) there is inconsistent evidence about the directionality of effects between learning and behavior problems. Consequently, understanding the impact of various factors (e.g., instructional delivery, classroom contexts, etc.) on academic achievement and behavior remains difficult.

Our article has four purposes. First, we review research examining the relationship between learning and behavior problems. Second, we discuss classroom contextual factors, including teacher instructional behavior, that might influence the relationship between academic failure and problem behavior. Third, we discuss assessment procedures currently available that can help describe classroom contexts, followed by a brief description of how these assessments may help identify factors that can influence a treatment's effectiveness. Last, we discuss implications for research, with a specific focus on important outcomes for future research.

The Relationship Between Academic and Behavior Problems

The research literature consistently supports a co-occurrence between academic failure and problem behavior (e.g., Hinshaw, 1992). Establishing the directionality of the relationship between learning and behavior problems has been of interest to the research community for several decades. Some studies point to the influence of students' behavior on their learning problems, whereas others point to the influence of students' learning problems on their behavior. For example, after statistically controlling for differences in prior achievement, Chen, Rubin, and Li (1997) found that fourth-grade students who were aggressive and disruptive displayed lower academic achievement in sixth grade than did fourth-grade students who were not displaying these behaviors. Similarly, Masten et al. (1995) found that problem behavior in late childhood predicted academic achievement in late adolescence. On the other hand, Jorm, Share, Matthews, and Maclean (1986) found that children with reading problems were more likely to demonstrate antisocial behavior than were students without reading problems by the end of Grade 1 and in Grade 2, even though there were no differences in antisocial behavior between children with and without reading problems in kindergarten. McGee, Williams, Share, Anderson, and Silva (1986) found that for students with reading problems, their frequency of problem behaviors increased more quickly between ages 5 and 9 than for students without reading problems. These studies are just a few examples of continued work in this area to predict patterns of influence between students' learning and behavior problems.

Why might there be a relationship between learning and behavior problems, and why have researchers been unable to establish the directionality of this relationship? Miles and Stipek (2006) describe two differing theoretical explanations that point to the bidirectional influence of learning and behavior over time. The first is based on the notion that aggression results from the frustration students feel when faced with academic failure. Because it may take time for a child's academic experiences to stabilize or become consistent enough to begin to affect his or her feelings about the task demands, it may take a while before the child grows frustrated enough to begin avoiding academic tasks through acting-out behaviors (Chapman, Tunmer, & Prochnow, 2000). The second explanation is based on the idea of emerging normative comparisons. Here, as students grow older they become increasingly more aware of their abilities and performances in comparison to their peers. Those noticing that they are far behind their peers may become embarrassed by their failures, leading to negative emotions that may set the stage for increased problem behavior. In either account, some time may pass before academic problems begin to negatively affect children's classroom behavior and vice versa.

Findings from at least three recent studies support the hypothesis that the relationship between learning and behavior problems is developmental in nature. In the first study, Miles and Stipek (2006) found that aggression and literacy were not associated in kindergarten and first grade. However, an association developed over time, leading to significant associations in both third and fifth grades. These researchers also found that, even when holding initial levels of aggression constant, literacy in the first and third grades predicted aggression in the third and fifth grades, respectively, providing support for the developmental hypothesis that reading problems might contribute to aggression through children's increased awareness of social comparisons as they progress in school, in conjunction with increasingly difficult task demands in upper grades.

In the second study, Trzesniewski, Moffitt, Caspi, Taylor, and Maughan (2006) suggest that learning and behavior problems are not causally related but may in fact result from a common developmental antecedent. Using a twin-study design, these researchers found that a combination of environmental influences (e.g., socioeconomic status, maternal depression, growing up in a stimulating environment) had a significant effect on the association between reading problems and antisocial behavior. For example, a significant amount of common variance between reading problems and antisocial behavior was accounted for by "growing up in a stimulating environment," and this variable reduced the strength of the association between reading achievement and antisocial behavior. These authors note that the reciprocal influences of learning and behavior problems over time are suggested by the influence of the child's environment. They write, "The development of reading achievement and antisocial behavior are intertwined: as one changes, so does the other" (p. 83).

In the third study, Morgan, Farkas, Tufis, and Sperling (in press) found that, after statistically controlling for a wide range of potential confounds, children with reading problems in first grade were more likely to display poor task engagement, poor self-control, externalizing behavior problems, and internalizing behavior problems in third grade. For example, first-grade children who were poor readers were twice as likely to be task avoidant in third grade as were first-grade children who were not poor readers. At the same time, these authors also found that children displaying poor task engagement in first grade were more likely to experience reading problems in third grade. Here, first-grade children who were task avoidant were three times as likely to be poor readers in third grade as were first-grade children who were not task avoidant. After statistically controlling for poor attention, children who exhibited poor self-control, poor interpersonal skills, externalizing problem behaviors, or internalizing problem behaviors were not more likely to be poor readers in third grade than children without these problem behaviors.

Taken collectively, the extant literature points to a complex, bidirectional relationship between learning and behavior problems. Data from the Miles and Stipek (2006), Trzesniewski et al. (2006), and Morgan et al. (in press) studies suggest that reading and behavior problems cause each other over time, possibly influenced by other factors such as social comparisons, environment, and attention. Trzesniewski et al. suggest that research on learning and behavior problems may be best served by a focus on environmentally mediated effects. In their study, they focused specifically on home and family factors and their influence on the relationship between learning and behavior problems. The developmental hypotheses of Miles and Stipek suggest that the classroom context may also play a significant role in explaining the association between learning and behavior problems. Within the classroom context, Morgan et al. note the important role likely played by task engagement in the development of reading problems over time. Because poor task engagement is a common characteristic of students with EBD, and also often a targeted outcome of intervention research, the role of classroom contexts in clarifying the relationship between the learning and behavior problems of students with EBD is critical. For example, do classroom contextual factors that are associated with task engagement differentially affect the efficacy of interventions that target the learning or behavioral outcomes of students with EBD? In the following section, we detail how classroom contexts, and specifically teacher instructional behavior, may influence the relationship between the learning and behavior problems of students with EBD.

Classroom Contexts

Both students with EBD and their teachers can experience the classroom as an aversive environment (Gunter & Coutinho, 1997; Wehby, Symons, Canale, & Go, 1998). For example, Walker, Colvin, and Ramsy (1995) studied the classroom behavior of students identified with behavior problems and documented less time attending and complying to group directions; higher

rates of aggression and of out-of-seat and noise-making behaviors; and an overall higher rate of negative interactions with teachers. The impact of these high rates of problem behaviors can lead to the establishment of negative patterns of interaction between teachers and students (Gunter & Coutinho, 1997). One characteristic of these patterns is a low rate of instructional engagement, which can further undermine a student's academic progress (Sutherland & Wehby, 2001). Thus, the teacher's behavior (e.g., whether to provide the student with an opportunity to respond [OTR] to a question) can have strong associations with the student's behavior (e.g., whether to continue to be disruptive).

Teacher Behavior

The academic and behavioral challenges presented by students with EBD affect the nature of their interactions with their teachers. Aggressive behavior patterns increase the likelihood that children will develop negative relationships with their teachers (Ladd & Burgess, 1999). Indeed, problematic relationships in kindergarten between students with behavior problems and teachers are associated with academic and behavioral problems through eighth grade (Hamre & Pianta, 2001). Henricsson and Rydell (2004) report that poor teacher–student relationships tend to be stable over time and have a negative effect on school adjustment. These problematic relationships with teachers may contribute to the documented low rates of positive teacher attention, such as academic interactions, teacher praise, and OTRs in classrooms for students with EBD (e.g., Van Acker, Grant, & Henry, 1996; Wehby, Symons, & Shores, 1995). Teacher– student interactions in classrooms for students with EBD have been described both in terms of negative reinforcement (e.g., Gunter & Coutinho, 1997) and as reflecting the transactional nature of social interchanges (Sutherland & Morgan, 2003).

Students with and at risk for developing EBD are uniquely influenced by teacher–student interaction patterns in general education classrooms. General education teachers sometimes believe that their classrooms are inappropriate placements for students with EBD (Schumm & Vaughn, 1992). Yet general education teachers tend to make limited accommodations and/or are resistant to changes in tasks, materials, and teaching formats (Lago-Delello, 1998). In addition, these teachers identified alternative placements to be the most needed modification (Lago-Delello, 1998). This is important because Good and Brophy (1972) identified teacher perceptions of students' academic and behavior skills as a critical classroom variable. Unfortunately, students who fail to meet teacher expectations are at risk for social and academic failure (Lane, Wehby, & Cooley, 2006), rejected by their teachers, and perceived as having less ideal student characteristics (Lago-Delello, 1998). It is likely that the challenges presented by students with learning and behavior problems, in both special education and general education classrooms, result in their receiving differential rates of desired teacher instructional variables over time, based in part on the ongoing reciprocal influences of teacher and students on each other (Sutherland & Oswald, 2005).

Instructional Variables

So, what can be done to affect the classroom context of students with EBD? The answer to this question is important if practitioners are to be more likely to improve both the academic and behavioral deficits of these students. That is, the identification and consideration of classroom instructional variables are needed before changes in student behavior may occur (Gunter, Jack, Shores, Carrell, & Flowers, 1993; Stichter, Hudson, & Sasso, 2005; Stichter, Lewis, Johnson, & Trussell, 2004). For example, if one is seeking to change the contingencies that maintain a student's inappropriate behavior, then it is important to provide both student- and teacher-level interventions. The program of research by Gunter and his colleagues makes a strong case for examining the nature of the student–teacher relationship when attempting to improve sustained use of effective practices, such as reinforcement and adequate OTR by teachers.

Although descriptive studies have shown that classrooms for students with EBD, as well as general education settings including students at risk for EBD, are characterized by little reinforcement for prosocial behavior and high rates of responses to disruptive behavior (Lago-Delello, 1998; Shores, Jack, et al., 1993; Van Acker et al., 1996; Wehby et al., 1995), proactive behavior and classroom management has been shown to reduce problem behavior and increase student academic engaged time (Witt, VanDerHyeden, & Gilbertson, 2004). For example, the use of clear explanations and routines (Kameenui, 1995), posted and taught rules (Emmer & Stough, 2001), and precorrection strategies (Colvin, Sugai, Good, & Lee, 1997) are effective in creating positive classroom environments. In a meta-analysis of effective classroom

variables, Marzano (2003) found that teachers' use of rules and procedures significantly affected student outcomes. Prior research demonstrates that the use of clearly defined rules and expectations and reinforcement of the expectations have been shown to decrease inappropriate behaviors and increase academic achievement (Shores, Jack, et al. 1993; Mayer, 1999). Other features of effective classroom management identified in the literature include (a) the type of physical organization of the classroom to promote learning (Shores, Jack, et al., 1993); (b) the design and teaching of clear expectations and routines (Shores, Gunter, & Jack, 1993); (c) the use of positive systems that reinforce appropriate behavior (i.e., points or tokens; Mayer, 1999; Shores, Gunter, et al., 1993); (d) academic and curricular restructuring (e.g., task variation, pace of instruction, opportunities for student responses, full use of the instructional time; Alberto & Troutman, 1999; Lewis & Sugai, 1999); and (e) frequent teacher movement patterns around the classroom (Evertson, 1989; Good & Grouws, 1979, as cited in Rosenshine & Stevens, 1986; Lewis & Sugai, 1999; Shores, Jack, et al., 1993).

The ability of teachers to provide quality instruction (e.g., promoting frequent rates of students' correct responses) to students with EBD is another factor that contributes to the quality of teacher–student interactions (Wehby et al., 1998). For example, providing frequent praise and OTRs to academic requests (e.g., Sutherland, Alder, & Gunter, 2003; Sutherland, Wehby, & Copeland, 2000) seems to improve the student's behavior in the classroom. Sutherland et al. (2000) found increases in task engagement when a teacher increased his rate of behavior-specific praise. Sutherland et al. (2003) found that increased rates of OTR resulted in increased rates of correct responses and task engagement and in decreased rates of disruptive behavior.

The previous section has focused on the relationship between the classroom context and, specifically, teacher instructional behavior on the academic and behavioral outcomes of students with EBD. Gaining a better understanding of how these contexts might influence the relationship between learning and behavior problems has significant implications for interventions designed to affect students' developmental outcomes. In the following section, we will discuss means to assess these classroom contexts in order to more specifically identify crucial contextual variables.

Assessing Classroom Contexts

The complex and varied nature of classrooms poses significant challenges for applied research to effectively develop valid measures that capture the idiosyncratic and multidirectional relationships between these variables and simultaneously put forth common criteria for their application in future research and for resulting intervention standards. That is, effectively targeting children's academic skills for remediation requires an assessment of key contextual (i.e., for whom and under what conditions) variables in order to strengthen the likelihood of treatment efficacy. Two primary categories of assessment have emerged. One is descriptive; the other is experimental. Both are forms of ecobehavioral assessment that by design have four primary purposes (Greenwood, Carta, Kamps, & Arreaga-Mayer, 1990): (a) to identify and describe the classroom environment; (b) to describe and compare contextual variables across classrooms (Brophy & Good, 1986); (c) to identify the key existing variables associated with high levels of achievement and engagement (Gunter, Coutinho, & Cade, 2002); and (d) to utilize the assessment to monitor changes within classrooms, by both students and teachers, as a result of experimental manipulation of the key variables associated with high achievement (Stichter & Conroy, 2005). As a result, the field has benefited from a significant literature base that suggests that student engagement and active responding are strongly and positively correlated with academic gains and a pivotal component of the prevention of school failure (Brophy & Good, 1986; Englert, 1983; Greenwood, 1991; Gunter et al., 2002; Kamps, Kravits, Rauch, Kamps, & Chung, 2000). Following, we provide a brief overview of previous and current trends in the use of these ecobehavioral assessments of student outcomes related to variables within classroom settings.

Descriptive Assessments

Probably the most commonly cited examples of ecobehavioral assessments are those that have taken a broad, or macro, approach to assessment. These assessments tend to capture the natural rates of contextual variables within the classroom as they occur, related to student engagement or responding under various conditions, such as with preservice versus inservice teachers, specific curricula, or across classrooms (Brophy & Good, 1986; Stichter, Clarke, & Dunlap, 2004; Roberson, Woolsey, Seabrooks, & Williams,

2004). For example, Powell (1980) initiated one of the first broad-scale studies of this type, titled the *Beginning Teacher Evaluation Study* (BTES), which resulted in a series of studies designed to assess teacher competencies in the area of reading as they related to recent teacher graduates. Across 200 teachers in two grade levels, generic and specific teacher behaviors were identified that were correlated with higher student achievement in reading (Powell, 1980). These data, with data from subsequent administrations of the BTES (Good, Grouws, & Ebmeier, 1983), data from concurrent work by Greenwood and colleagues from their 10-year study on students' OTRs (Greenwood, Delquardi, & Hall, 1984), and teacher effectiveness data from Englert (1983) and Brophy and Good (1986), helped establish what is now often referred to as the *effective-teacher literature* (Jones & Jones, 2006). From this foundation, subsequent tools have been created to support concentrated research on specific variables such as levels and types of direct instruction, opportunities for student responding, environmental contexts, and peer influences that are considered particularly pivotal to levels of students' active responding and engagement (Roberson et al., 2004; Sutherland, Alder & Gunter, 2003). Examples include the *Academic Learning Time* framework (Romberg, 1980); the *Direct Instruction Observation System* (Englert & Sugai, 1981); the *Teacher/Student Interaction Analysis* (Sugai & Lewis, 1989); the *Classroom Activity Recording Form* (Sindelar, Smith, Harriman, Hale, & Wilson, 1986); *Setting Factors Assessment Tool* (Stichter, Lewis, et al., 2004); the *Social Skills Interview* (Asmus, Conroy, Ladwig, Boyd, & Sellers, 2004), and the *Snapshot Assessment Tool* (Conroy, Asmus, Ladwig, Sellers, & Boyd, 2004). Again, the aforementioned examples of ecobehavioral assessments are consistent with a class of assessments that by design tend to be more macro in nature or rely on descriptive methods to render findings regarding students' outcomes within the context of classroom instruction. However, as more information has become available about the potential impact of specific contextual variables on student outcomes, it is very clear that to effectively inform practice, the need remains to further clarify the role that both the context and the learner have on one another.

Identifying Functional Relationships

A central tenet of applied behavior analysis is that behavior is functionally related to the environment (Baer, Wolf, & Risley, 1968). As variables in that environment are altered, the likelihood of behavior occurring or not occurring is increased or decreased. Likewise, if students engage in problem behavior, the likelihood that others interacting in that environment (e.g., peers, teachers, school staff) will respond in predictable ways increases. The implication for educators is to understand that they cannot make children learn, nor can they make children behave. Instead, educators can embed effective instruction and support strategies within classroom environments to increase the likelihood that students will learn and engage in prosocial behavior (e.g., Kamps et al., 2000; Lane, 2004; Sutherland et al., 2003).

Experimental methods best designed to assess functional relationships between the specific classroom characteristics and student outcomes are functional and structural analyses (Repp, 1994; Stichter, 2001; Stichter & Conroy, 2005). Functional and structural analyses are forms of ecobehavioral assessments that concentrate specifically on the impact of one or more targeted instructional or setting variable on the rates of student active responding and achievement (Kantor, 1959; B. F. Skinner, 1953). Whereas structural analyses focus specifically on the variables that evoke the student response of interest, functional analyses place specific emphasis on those variables that maintain the rate and type of student behavior (Stichter & Conroy, 2005). Both procedures may assess the same variables and their relationship to student outcomes, such as task difficulty, noise level, or amount of teacher praise. However, structural analyses typically are designed to assess the impact of the presence or absence of the variable on student outcomes while maintaining the stable consequences (e.g., presenting student with challenging tasks or classroom noise level; Stichter et al., 2005), whereas functional analyses have been most often employed to assess the role of various types and levels of consequences that seem to maintain specific student outcomes (e.g., rates of positive teacher feedback).

Although a body of research establishes the effectiveness of structural and functional analytic forms of ecobehavioral assessments for students with EBD, particular challenges remain to help establish the efficacy of these assessments. These challenges include establishing (a) the technical adequacy of these procedures in terms of reliability and validity within applied settings (Conroy & Stichter, 2003; Gresham, 2003; Stichter & Conroy, 2003), (b) the ability or willingness of school personnel to conduct and use tightly controlled processes of analysis (Gresham, Watson, & Skinner, 2001;

Nelson, Roberts, Mathur, & Rutherford, 1999), and (c) the contextual fit of these assessments for students identified as at risk for or with EBD who exhibit low-frequency or covert responses to variables in school settings that affect outcomes. This is not to say that these assessments should not be used in applied settings. The assessments have been used to clarify the relationship between classroom context and a wide range of student outcomes such as (a) performance in reading (Carnine, 1976; C. H. Skinner, Smith, & McLean, 1994), (b) performance in math (C. H. Skinner, Ford, & Yunker, 1991; C. H. Skinner, Belfiore, Mace, Williams-Wilson, & Johns, 1997), (c) task engagement (Carnine, 1976; Sutherland et al., 2003), and (d) prosocial behaviors (Stichter et al., 2005). Despite ongoing research emphasizing more user-friendly, validated descriptive assessments (Stichter, Lewis, et al., 2004), significant work remains in this area to identify student, teacher, and contextual variables affecting outcomes for students with EBD.

Directions for Academic and Behavioral Outcome Research in EBD

Earlier in this article we described teacher instructional behavior and classroom contextual factors associated with learning and behavior problems, procedures to assess classroom contexts, and how identified variables might be associated with learning and behavioral outcomes. The question becomes, where does the EBD research community go from here? Our suggestions for the direction of EBD research in academic and behavioral outcomes draw on those provided by Odom et al. (2005). These suggestions are framed by our perspective that learning and behavior problems are reciprocal in nature, influencing each other over time, providing researchers in EBD with unique responsibilities as they advance science in this area.

Odom et al. (2005) note that educational research should be viewed as a continuum, with a particular focus not on methodology but on using science to advance the educational outcomes of all children. We would agree with this assertion. To date, both descriptive and experimental work in EBD have provided data on factors associated with learning and behavior, and this work should be continued. Specifically, single-subject studies in EBD can continue to help identify promising classroom-based interventions. Researchers in EBD can also capitalize on the focus from the U. S. Department of Education on evaluating treatment effectiveness using randomized clinical trials (RCT) to then use promising practices identified from single-subject research as a springboard for large-sample trials.

As researchers in EBD begin to evaluate interventions in RCT, it will be critical to assess contextual factors within classrooms that might influence treatment effectiveness. Characteristics unique to students with EBD (e.g., disruptive behavior, learning problems, attention problems, etc.), teachers (e.g., burnout, inexperience, lack of training), and the dynamic interplay between factors (e.g., teacher–student interaction, association between learning and behavior problems) should be measured and analyzed to determine for whom and under what conditions interventions work and the means through which a treatment affects an outcome.

Measuring contextual variables within RCT that may be associated with treatment outcomes may also provide information on the mechanisms related to treatment effectiveness. Kraemer and colleagues point out that the identification of moderator variables can help practitioners determine for whom the treatment is most effective (Kraemer, Wilson, Fairburn, & Agras, 2002). In their influential article on moderator–mediator variable distinction, Baron and Kenny (1986) describe moderators as variables that have an effect on the relationship between the independent and dependent variables (see Baron & Kenny, 1986, and Cole & Maxwell, 2003, for a detailed discussion of moderators and mediators, including measurement criteria). Baron and Kenny note that "moderation implies that the causal relation between two variables changes as a function of the moderator variable" (p. 1174). To illustrate, Yoon (2002) found that grade level moderates the effects of sustained silent reading on students' attitudes toward reading. Specifically, more positive effects on reading attitudes following sustained silent-reading interventions were noted for younger students than for older students.

By contrast, a variable mediates the relationship between the independent and dependent variables when it accounts for the relation between the two; mediators help explain how or why the dependent variable is affected by the independent variable (Baron & Kenny, 1986). Analytically, a variable serves as a mediator (a) when the independent variable has an effect on the mediator; (b) when the mediator has an effect on the dependent variable, controlling for the independent variable; and (c) when (a) and (b) are controlled, the relationship between the dependent and

independent variables is no longer significant (Baron & Kenny, 1986; Cole & Maxwell, 2003). For example, DuBois and Silverthorn (2004) found that deviant peer associations mediated the association between self-esteem and problem behavior. That is, self-esteem was associated with deviant peer associations, and deviant peer associations were associated with problem behavior. However, without the effect of deviant peer associations, self-esteem no longer predicted problem behavior, suggesting that peer associations are the mechanism through which self-esteem is related to problem behavior.

This is not to suggest that researchers must (or, for that matter, can) measure all possible variables; they should, however use sound theory for identifying variables that might moderate or mediate a treatment's effectiveness. Through systematic and rigorous evaluation of classroom-based interventions, as well as variables associated with their effectiveness, researchers may be able to shed significant light on the relationship between the learning and behavioral problems of students with EBD.

Summary

Researchers continue to identify classroom-based interventions that have positive effects on the learning and behavioral outcomes of students with EBD. The literature suggests that these student outcomes are related and most likely influence each other over time. Moreover, due to the heterogeneity of students with EBD, their teachers, and the settings in which students with EBD are educated, multiple factors can and do influence the efficacy of classroom-based interventions. Thus, researchers must not only strive to create interventions that target both academic and behavioral outcomes but also continually measure intervention effects on both academic and behavioral domains. Measuring classroom outcomes of students with EBD over time has not been a particular strength of research to date. In addition, although classroom-based interventions have been identified that result in some positive outcomes for students with EBD, encouraging their use by teachers over time has proven difficult. Heward (1994) pointed out the importance of investigating what must be done to facilitate teachers' adoption and continued implementation of effective methods, and an ongoing prompt or evaluation system may be needed to maintain a minimum rate of effective teaching practices. Sutherland and Morgan (2003) highlight the dynamic relationship between teacher and student behavior, which may also affect the implementation of effective practices in the classroom. Regardless, there appears to be an association over time between both teacher and student behavior that results in changes in the behavior of both. Combine these social transactions with the developmental association between learning and behavior problems, and a complex web of associated factors emerges. Interventions targeting multiple levels (e.g., teacher, student, peer) of classroom contexts appear necessary to result in any significant change in developmental outcomes.

An example of targeting only one level of the classroom context has been the tendency of researchers in EBD to focus on interventions to reduce problem behavior. Implicit in this approach is that by reducing problem behavior, students' academic and social outcomes might improve. Although this assumption may have some merit, for many students with EBD simply reducing disruptive behavior might not result in a change in the one behavior that appears to be associated with learning and behavior problems: task engagement. Moreover, by ignoring the associated academic problems often concurrent with problem behaviors, treatment efficacy has been further limited. The current state of research on teacher and context presented in this article points to the need for practitioners to target those behaviors most related to meeting the classroom's learning demands (e.g., paying attention, staying organized, being flexible) in addition to specific academic skills if they are to best help children achieve academically. Thus, in terms of clarifying outcomes for students with EBD, reducing disruptive behavior may be less important to academic outcomes for students than are increasing task engagement and active responding. Although reducing disruptive behavior might have positive effects on the classroom environment and associated variables, increasing task engagement might increase the efficacy of instructional procedures in the classroom, resulting in increases in achievement and concomitant positive developmental outcomes, including providing incidental opportunities for prosocial instruction in the context of instructional demands.

In summary, research in EBD has provided a wealth of information about variables that are associated with desirable outcomes for students with EBD. EBD researchers bring strengths born of decades of research measuring human behavior. For example, direct observation measurement tools in EBD research, and developmental disability research in general, are highly advanced in their ability to operationalize and

measure target behaviors and to describe behavioral contexts. Ecobehavioral assessments (descriptive analysis and structural and functional analysis) provide researchers a process for evaluating and assessing the complex and multivariable factors that influence student success and fidelity of implementation. Research focusing on students with EBD must include both academic and social variables as well as the interaction between these factors. These fine-tuned observational techniques have the potential to add significantly to our knowledge of treatment efficacy; specifically, researchers in EBD should be well prepared to document and explain moderator and mediator effects in future intervention studies. Clarifying classroom-based outcomes for students with EBD, in addition to variables associated with treatment change, will allow us to better design interventions that are more efficacious and sustainable.

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Kevin S. Sutherland is an associate professor of special education and disability policy at Virginia Commonwealth University. His primary areas of interest include teacher–student interactions in classrooms for students with emotional and behavioral disorders, the relationship between learning and behavior problems, and intervention research.

Teri Lewis-Palmer received her PhD at the University of Oregon in 1998. Her research focuses on the application of applied behavior analysis at the schoolwide, classroom, and individual student level and the use of functional behavior assessment procedures in school settings.

Janine Stichter is an associate professor in the Department of Special Education and is also an associate director for the Thompson Center for Autism and Neurodevelopmental Disorders at the University of Missouri–Columbia. She conducts research in areas of functional analysis, social competence, and the correlation of specific environmental variables with increases in prosocial and academic behaviors.

Paul L. Morgan is an assistant professor in the Department of Educational and School Psychology and Special Education at Pennsylvania State University. His research interests include understanding and affecting factors influencing children's growth as readers, especially those factors that lead some children to be at increased risk for academic failure.